

# Configurando backup ISDN BRI de vários enlaces com relógio do discador

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## [Introdução](#)

Este documento fornece uma configuração de exemplo configurando um backup ISDN do BRI multilink usando o Dialer Watch.

Fornece comandos do Troubleshooting básico, assim como instruções específicas para pesquisar defeitos configurações o multilink (PPP) ponto a ponto executado em um cenário de backup conjuntamente com o Dialer Watch.

Esta configuração pode ser usada quando a relação ou as subinterfaces do Frame Relay principal vão para baixo.

## [Pré-requisitos](#)

### [Requisitos](#)

Não existem requisitos específicos para este documento.

### [Componentes Utilizados](#)

As informações neste documento são baseadas nas versões de software e hardware abaixo.

- Dois Software Release 12.2(3) e 12.2(5) sendo executado de Cisco IOS® dos Cisco 2500

Router ([DTEs] do equipamento de terminal de dados do Frame Relay).

- Um Cisco 4500 Router que atua como um Frame Relay Switch.

As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se você estiver trabalhando em uma rede ativa, certifique-se de que entende o impacto potencial de qualquer comando antes de utilizá-lo.

## Convenções

Para obter mais informações sobre convenções de documento, consulte as [Convenções de dicas técnicas Cisco](#).

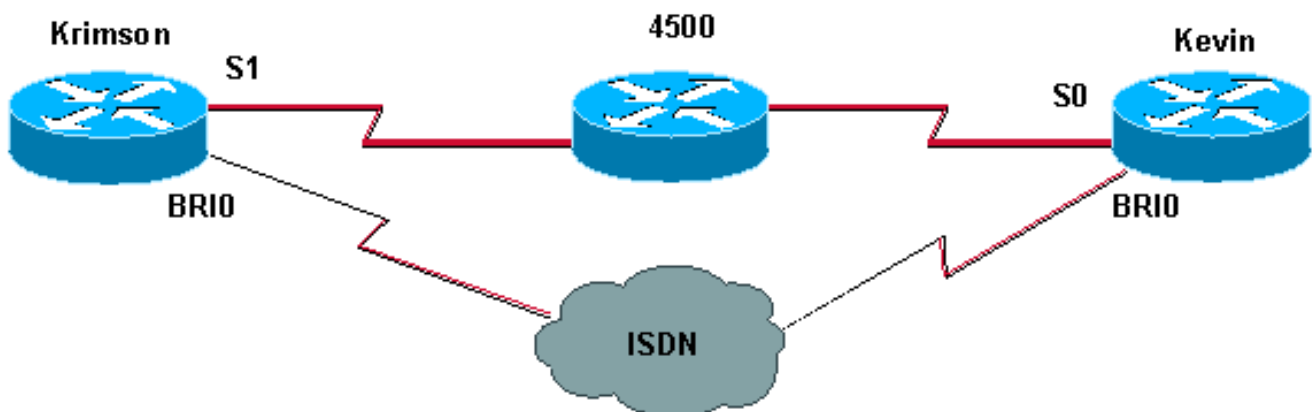
## Configurar

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

**Note:** Para obter mais informações sobre os comandos usados neste documento use a [ferramenta de Consulta de comando](#).

## Diagrama de Rede

Este documento utiliza a instalação de rede mostrada no diagrama abaixo.



## Configurações

Este documento utiliza as configurações mostradas abaixo.

- [krimson \(Cisco 2500 Router\)](#)
- [kevin \(Cisco 2500 Router\)](#)

### **krimson (Cisco 2500 Router)**

```
krimson#show running-config
Building configuration...
!
version 12.2
```

```
service timestamps debug datetime msec
service timestamps log datetime msec
hostname krimson
!
username kevin password 0 <password>
!
isdn switch-type basic-net3
!
interface Loopback0
ip address 10.7.7.1 255.255.255.0
ip ospf network point-to-point
!
interface Ethernet0
ip address 10.200.16.30 255.255.255.0
!
interface Serial1
bandwidth 64
no ip address
encapsulation frame-relay
!
interface Serial1.1 point-to-point
ip address 10.5.5.2 255.255.255.0
no ip route-cache
frame-relay interface-dlci 20
!
interface BRI0
no ip address
encapsulation ppp
no ip route-cache
no ip mroute-cache
load-interval 30
no keepalive
dialer pool-member 1
isdn switch-type basic-net3
no fair-queue
no cdp enable
ppp authentication chap
!
interface Dialer0
ip address 10.9.9.1 255.255.255.0
encapsulation ppp
no ip route-cache
no ip mroute-cache
dialer pool 1
dialer remote-name kevin
dialer string 6120
dialer load-threshold 1 either
dialer watch-group 1
dialer-group 1
no cdp enable
ppp authentication chap
ppp multilink
!
!
router ospf 10
log-adjacency-changes
network 10.5.5.0 0.0.0.255 area 0
network 10.7.7.0 0.0.0.255 area 0
network 10.9.9.0 0.0.0.255 area 0
!
ip default-gateway 10.200.16.1
no ip classless
ip route 0.0.0.0 0.0.0.0 10.200.16.1
no ip http server
```

```
!  
access-list 101 deny ospf any any  
access-list 101 permit ip any any  
dialer watch-list 1 ip 10.8.8.0 255.255.255.0  
dialer-list 1 protocol ip list 101  
!  
line con 0  
exec-timeout 0 0  
privilege level 15  
line aux 0  
transport input all  
line vty 0 4  
exec-timeout 0 0  
password <password>  
login  
!  
end
```

### kevin (Cisco 2500 Router)

```
kevin#show running-config  
Building configuration...  
!  
version 12.2  
service timestamps debug datetime msec  
service timestamps log datetime msec  
!  
hostname kevin  
!  
username krimson password 0 <password>  
!  
isdn switch-type basic-net3  
!  
!  
interface Loopback0  
ip address 10.8.8.1 255.255.255.0  
ip ospf network point-to-point  
!  
interface Loopback1  
ip address 172.19.0.1 255.255.255.255  
!  
interface Ethernet0  
ip address 10.200.16.26 255.255.255.0  
!  
interface Serial0  
no ip address  
encapsulation frame-relay  
!  
interface Serial0.1 point-to-point  
ip address 10.5.5.1 255.255.255.0  
no cdp enable  
frame-relay interface-dlci 20  
!  
interface BRI0  
no ip address  
encapsulation ppp  
dialer pool-member 1  
isdn switch-type basic-net3  
no cdp enable  
ppp authentication chap  
!  
interface Dialer0
```

```
ip address 10.9.9.2 255.255.255.0
encapsulation ppp
dialer pool 1
dialer remote-name krimson
dialer-group 1
no cdp enable
ppp authentication chap
ppp multilink
!
router ospf 10
log-adjacency-changes
network 10.5.5.0 0.0.0.255 area 0
network 10.8.8.0 0.0.0.255 area 0
network 10.9.9.0 0.0.0.255 area 0
!
ip default-gateway 10.200.16.1
ip classless
ip route 0.0.0.0 0.0.0.0 10.200.16.1
no ip http server
!
access-list 101 deny ospf any any
access-list 101 permit ip any any
dialer-list 1 protocol ip list 101
!
!
line con 0
exec-timeout 0 0
line aux 0
modem InOut
line vty 0 4
exec-timeout 0 0
password <password>
login
!
end
```

## Verificar

Esta seção fornece informações que você pode usar para confirmar se sua configuração está funcionando adequadamente.

Determinados comandos show são suportados pela Ferramenta Output Interpreter, que permite que você veja uma análise do resultado do comando show.

- **show interfaces serial** - Exibe informações sobre o Identificador de Conexão do Enlace de Dados (DLCI) de transmissão múltipla, os DLCIs usados na interface e o DLCI usado na Interface de Gerenciamento Local (MLI).
- **show interface dialer** - Indica a informação sobre a interface do discador.
- **show ip route** - Exibe entradas de tabela de IP Routing.
- **pvc do show frame-relay** - Indica o estado dos PVC no roteador.

## Exemplo de saída do comando show

Os seguintes **comandos show** mostram o estado inicial no roteador de chamada quando o Link do Frame Relay for ascendente e funcional:

krimson#show interface serial 1.1

Serial1.1 is up, line protocol is up  
Hardware is HD64570  
Internet address is 10.5.5.2/24  
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation FRAME-RELAY

krimson#show frame pvc

PVC Statistics for interface Serial1 (Frame Relay DTE)

Active Inactive Deleted Static

Local 1 0 0 0

Switched 0 0 0 0

Unused 0 0 0 0

DLCI = 20, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial1.1

input pkts 53280 output pkts 62150 in bytes 3851528  
out bytes 6340750 dropped pkts 0 in FECN pkts 0  
in BECN pkts 0 out FECN pkts 0 out BECN pkts 0  
in DE pkts 0 out DE pkts 0  
out bcast pkts 62092 out bcast bytes 6334184  
pvc create time 1w2d, last time pvc status changed 00:02:54

krimson#show interface dialer 0

Dialer0 is up (spoofing), line protocol is up (spoofing)  
Hardware is Unknown  
Internet address is 10.9.9.1/24  
MTU 1500 bytes, BW 56 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation PPP, loopback not set  
DTR is pulsed for 1 seconds on reset  
Last input 00:01:50, output never, output hang never  
Last clearing of "show interface" counters 8w0d  
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0  
Queueing strategy: weighted fair  
Output queue: 0/1000/64/0 (size/max total/threshold/drops)  
Conversations 0/1/16 (active/max active/max total)  
Reserved Conversations 0/0 (allocated/max allocated)  
Available Bandwidth 12 kilobits/sec  
5 minute input rate 0 bits/sec, 0 packets/sec  
5 minute output rate 0 bits/sec, 0 packets/sec  
31010 packets input, 2101372 bytes  
31036 packets output, 2100401 bytes

krimson#show interface serial 1

Serial1 is up, line protocol is up  
Hardware is HD64570  
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation FRAME-RELAY, loopback not set  
Keepalive set (10 sec)  
LMI enq sent 53297, LMI stat recvd 52975, LMI upd recvd 0, DTE LMI up  
LMI enq recvd 3, LMI stat sent 0, LMI upd sent 0  
LMI DLCI 1023 LMI type is CISCO frame relay DTE  
FR SVC disabled, LAPF state down  
Broadcast queue 0/64, broadcasts sent/dropped 62118/1, interface broadcasts 53298  
Last input 00:00:01, output 00:00:01, output hang never  
Last clearing of "show interface" counters 3w1d  
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0  
Queueing strategy: weighted fair  
Output queue: 0/1000/64/0 (size/max total/threshold/drops)  
Conversations 0/3/16 (active/max active/max total)

```
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 48 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
106412 packets input, 4626191 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
115787 packets output, 7047349 bytes, 0 underruns
0 output errors, 0 collisions, 46425 interface resets
0 output buffer failures, 0 output buffers swapped out
76 carrier transitions
DCD=up DSR=up DTR=up RTS=up CTS=up
```

#### krimson#show ip route

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

```
Gateway of last resort is 10.200.16.1 to network 0.0.0.0
```

```
192.168.64.0/30 is subnetted, 1 subnets
C 192.168.64.0 is directly connected, Dialer4
10.0.0.0/24 is subnetted, 6 subnets
C 10.5.5.0 is directly connected, Serial1.1
O 10.8.8.0 [110/1563] via 10.5.5.1, 00:04:35, Serial1.1
C 10.9.9.0 is directly connected, Dialer0
C 10.7.7.0 is directly connected, Loopback0
C 10.9.8.0 is directly connected, Dialer1
C 10.200.16.0 is directly connected, Ethernet0
S* 0.0.0.0/0 [1/0] via 10.200.16.1
```

A seguinte saída mostra que o Link do Frame Relay está indo para baixo e o enlace de ISDN vem acima:

```
*Apr 26 04:57:25.801: OSPF: Rcv hello from 172.19.0.1 area 0 from Serial1.1 10.5.5.1
*Apr 26 04:57:25.805: OSPF: End of hello processing

*Apr 26 04:57:36.765: %LINK-3-UPDOWN: Interface Serial1, changed state to down
*Apr 26 04:57:36.773: OSPF: Interface Serial1.1 going Down
*Apr 26 04:57:36.777: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Serial1.1
from FULL to DOWN, Neighbor Down: Interface down or detached
*Apr 26 04:57:36.921: DDR: Dialer Watch: watch-group = 1
*Apr 26 04:57:36.925: DDR: network 10.8.8.0/255.255.255.0 DOWN,
*Apr 26 04:57:36.929: DDR: primary DOWN
*Apr 26 04:57:36.929: DDR: Dialer Watch: Dial Reason: Primary of group 1 DOWN
*Apr 26 04:57:36.933: DDR: Dialer Watch: watch-group = 1,
*Apr 26 04:57:36.933: BR0 DDR: rotor dialout [priority]
*Apr 26 04:57:36.933: DDR: dialing secondary by dialer string 6120 on Di0
*Apr 26 04:57:36.937: BR0 DDR: Attempting to dial 6120
*Apr 26 04:57:36.941: ISDN BR0: Outgoing call id = 0x818B, dsl 0
*Apr 26 04:57:37.033: ISDN BR0: Event: Call to 6120 at 64 Kb/s
*Apr 26 04:57:37.033: ISDN BR0: process_bri_call(): call id 0x818B, called_number
6120, speed 64, call type DATA
*Apr 26 04:57:37.037: CCBRI_Go Fr Host InPkgInfo (Len=20) :
*Apr 26 04:57:37.041: 1 0 1 81 8B 0 4 2 88 90 18 1 83 70 5 80 36 31 32 30
*Apr 26 04:57:37.049:
*Apr 26 04:57:37.049: CC_CHAN_GetIdleChanbri: dsl 0
*Apr 26 04:57:37.053: Found idle channel B1
*Apr 26 04:57:37.065: ISDN BR0: TX -> SETUP pd = 8 callref = 0x0E
```

```
*Apr 26 04:57:37.069: Bearer Capability i = 0x8890
*Apr 26 04:57:37.077: Channel ID i = 0x83
*Apr 26 04:57:37.081: Called Party Number i = 0x80, '6120', Plan:Unknown,
Type:Unknown
*Apr 26 04:57:37.161: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x8E
*Apr 26 04:57:37.165: Channel ID i = 0x89
*Apr 26 04:57:37.181: CCBRI_Go Fr L3 pkt (Len=7) :
*Apr 26 04:57:37.181: 2 1 E 98 18 1 89
*Apr 26 04:57:37.185:
*Apr 26 04:57:37.189: ISDN BR0: LIF_EVENT: ces/callid 1/0x818B HOST_PROCEEDING
*Apr 26 04:57:37.189: ISDN BR0: HOST_PROCEEDING
*Apr 26 04:57:37.193: ISDN BR0: HOST_MORE_INFO
*Apr 26 04:57:37.461: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x8E
*Apr 26 04:57:37.477: CCBRI_Go Fr L3 pkt (Len=4) :
*Apr 26 04:57:37.481: 7 1 E 91
*Apr 26 04:57:37.481:
*Apr 26 04:57:37.485: ISDN BR0: LIF_EVENT: ces/callid 1/0x818B HOST_CONNECT
*Apr 26 04:57:37.489: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
*Apr 26 04:57:37.493: BR0:1 DDR: Dialer Watch: resetting call in progress
*Apr 26 04:57:37.497: %DIALER-6-BIND: Interface BR0:1 bound to profile Di0
*Apr 26 04:57:37.509: ISDN: get_isdn_service_state(): idb 0x221DA8
bchan 2 is_isdn 1 Not a Pri
*Apr 26 04:57:37.513: BR0:1 PPP: Treating connection as a callout
*Apr 26 04:57:37.513: BR0:1 PPP: Phase is ESTABLISHING, Active Open
[0 sess, 0 load]
*Apr 26 04:57:37.517: BR0:1 LCP: O CONFREQ [Closed] id 102 len 29
*Apr 26 04:57:37.521: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.525: BR0:1 LCP: MagicNumber 0x2180E264 (0x05062180E264)
*Apr 26 04:57:37.529: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.529: BR0:1 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:37.533: ISDN BR0: Event: Connected to 6120 on B1 at 64 Kb/s
*Apr 26 04:57:37.541: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x0E
*Apr 26 04:57:37.581: BR0:1 LCP: I CONFREQ [REQsent] id 191 len 27
*Apr 26 04:57:37.585: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.589: BR0:1 LCP: MagicNumber 0xCA476259 (0x0506CA476259)
*Apr 26 04:57:37.593: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.593: BR0:1 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:37.601: BR0:1 LCP: O CONFACK [REQsent] id 191 len 27
*Apr 26 04:57:37.605: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.605: BR0:1 LCP: MagicNumber 0xCA476259 (0x0506CA476259)
*Apr 26 04:57:37.609: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.613: BR0:1 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:37.617: BR0:1 LCP: I CONFACK [ACKsent] id 102 len 29
*Apr 26 04:57:37.621: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.621: BR0:1 LCP: MagicNumber 0x2180E264 (0x05062180E264)
*Apr 26 04:57:37.625: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.629: BR0:1 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:37.633: BR0:1 LCP: State is Open
*Apr 26 04:57:37.633: BR0:1 PPP: Phase is AUTHENTICATING, by both
[0 sess, 0 load]
*Apr 26 04:57:37.637: BR0:1 CHAP: O CHALLENGE id 157 len 28 from "krimson"
*Apr 26 04:57:37.657: BR0:1 CHAP: I CHALLENGE id 159 len 26 from "kevin"
*Apr 26 04:57:37.661: BR0:1 CHAP: O RESPONSE id 159 len 28 from "krimson"
*Apr 26 04:57:37.709: BR0:1 CHAP: I SUCCESS id 159 len 4
*Apr 26 04:57:37.725: BR0:1 CHAP: I RESPONSE id 157 len 26 from "kevin"
*Apr 26 04:57:37.733: BR0:1 CHAP: O SUCCESS id 157 len 4
*Apr 26 04:57:37.737: BR0:1 PPP: Phase is VIRTUALIZED [0 sess, 0 load]
*Apr 26 04:57:37.745: Di0 PPP: Phase is UP [0 sess, 0 load]
*Apr 26 04:57:37.749: Di0 IPCP: O CONFREQ [Closed] id 103 len 10
*Apr 26 04:57:37.753: Di0 IPCP: Address 10.9.9.1 (0x03060A090901)
*Apr 26 04:57:37.757: Di0 MLP: Added first link BR0:1 to bundle kevin
*Apr 26 04:57:37.757: Di0 PPP: Treating connection as a callout
*Apr 26 04:57:37.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1,
changed state to down
```



```
*Apr 26 04:57:37.773: Di0 IPCP: I CONFREQ [REQsent] id 103 len 10
*Apr 26 04:57:37.777: Di0 IPCP: Address 10.9.9.2 (0x03060A090902)
*Apr 26 04:57:37.777: Di0 IPCP: O CONFACK [REQsent] id 103 len 10
*Apr 26 04:57:37.781: Di0 IPCP: Address 10.9.9.2 (0x03060A090902)
*Apr 26 04:57:37.801: Di0 IPCP: I CONFACK [ACKsent] id 103 len 10
*Apr 26 04:57:37.805: Di0 IPCP: Address 10.9.9.1 (0x03060A090901)
*Apr 26 04:57:37.805: Di0 IPCP: State is Open
*Apr 26 04:57:37.813: Di0 DDR: dialer protocol up
*Apr 26 04:57:37.821: Di0 IPCP: Install route to 10.9.9.2
*Apr 26 04:57:38.225: BR0 DDR: rotor dialout [priority]
*Apr 26 04:57:38.225: BR0 DDR: Attempting to dial 6120
*Apr 26 04:57:38.229: ISDN BR0: Outgoing call id = 0x818C, dsl 0
*Apr 26 04:57:38.233: ISDN BR0: Event: Call to 6120 at 64 Kb/s
*Apr 26 04:57:38.233: ISDN BR0: process_bri_call(): call id 0x818C, called_number
6120, speed 64, call type DATA
*Apr 26 04:57:38.237: CCBRI_Go Fr Host InPkgInfo (Len=20) :
*Apr 26 04:57:38.241: 1 0 1 81 8C 0 4 2 88 90 18 1 83 70 5 80 36 31 32 30
*Apr 26 04:57:38.249:
*Apr 26 04:57:38.249: CC_CHAN_GetIdleChanbri: dsl 0
*Apr 26 04:57:38.253: Found idle channel B2
*Apr 26 04:57:38.265: ISDN BR0: TX -> SETUP pd = 8 callref = 0x0F
*Apr 26 04:57:38.269: Bearer Capability i = 0x8890
*Apr 26 04:57:38.277: Channel ID i = 0x83
*Apr 26 04:57:38.281: Called Party Number i = 0x80, '6120', Plan:Unknown,
Type:Unknown
*Apr 26 04:57:38.377: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x8F
*Apr 26 04:57:38.385: Channel ID i = 0x8A
*Apr 26 04:57:38.405: CCBRI_Go Fr L3 pkt (Len=7) :
*Apr 26 04:57:38.405: 2 1 F 98 18 1 8A
*Apr 26 04:57:38.409:
*Apr 26 04:57:38.413: ISDN BR0: LIF_EVENT: ces/callid 1/0x818C HOST_PROCEEDING
*Apr 26 04:57:38.413: ISDN BR0: HOST_PROCEEDING
*Apr 26 04:57:38.417: ISDN BR0: HOST_MORE_INFO
*Apr 26 04:57:38.737: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up
*Apr 26 04:57:38.761: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x8F
*Apr 26 04:57:38.781: CCBRI_Go Fr L3 pkt (Len=4) :
*Apr 26 04:57:38.781: 7 1 F 91
*Apr 26 04:57:38.785:
*Apr 26 04:57:38.785: ISDN BR0: LIF_EVENT: ces/callid 1/0x818C HOST_CONNECT
*Apr 26 04:57:38.789: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up
*Apr 26 04:57:38.797: %DIALER-6-BIND: Interface BR0:2 bound to profile Di0
*Apr 26 04:57:38.805: %ISDN-6-CONNECT: Interface BRI0:1 is now connected
to 6120 kevin
*Apr 26 04:57:38.809: ISDN: get_isdn_service_state():
idb 0x225754 bchan 3 is_isdn 1 Not a Pri
*Apr 26 04:57:38.813: BR0:2 PPP: Treating connection as a callout
*Apr 26 04:57:38.817: BR0:2 PPP: Phase is ESTABLISHING, Active Open
[0 sess, 0 load]
*Apr 26 04:57:38.821: BR0:2 LCP: O CONFREQ [Closed] id 50 len 29
*Apr 26 04:57:38.825: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.825: BR0:2 LCP: MagicNumber 0x2180E77A (0x05062180E77A)
*Apr 26 04:57:38.829: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.833: BR0:2 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:38.837: ISDN BR0: Event: Connected to 6120 on B2 at 64 Kb/s
*Apr 26 04:57:38.845: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x0F
*Apr 26 04:57:38.885: BR0:2 LCP: I CONFREQ [REQsent] id 102 len 27
*Apr 26 04:57:38.889: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.893: BR0:2 LCP: MagicNumber 0xCA476774 (0x0506CA476774)
*Apr 26 04:57:38.897: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.897: BR0:2 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:38.905: BR0:2 LCP: O CONFACK [REQsent] id 102 len 27
*Apr 26 04:57:38.905: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.909: BR0:2 LCP: MagicNumber 0xCA476774 (0x0506CA476774)
```

```

*Apr 26 04:57:38.913: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.917: BR0:2 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:38.921: BR0:2 LCP: I CONFACK [ACKsent] id 50 len 29
*Apr 26 04:57:38.925: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.925: BR0:2 LCP: MagicNumber 0x2180E77A (0x05062180E77A)
*Apr 26 04:57:38.929: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.933: BR0:2 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:38.937: BR0:2 LCP: State is Open
*Apr 26 04:57:38.937: BR0:2 PPP: Phase is AUTHENTICATING, by both
[0 sess, 0 load]
*Apr 26 04:57:38.941: BR0:2 CHAP: O CHALLENGE id 104 len 28 from "krimson"
*Apr 26 04:57:38.961: BR0:2 CHAP: I CHALLENGE id 102 len 26 from "kevin"
*Apr 26 04:57:38.969: BR0:2 CHAP: O RESPONSE id 102 len 28 from "krimson"
*Apr 26 04:57:39.017: BR0:2 CHAP: I SUCCESS id 102 len 4
*Apr 26 04:57:39.033: BR0:2 CHAP: I RESPONSE id 104 len 26 from "kevin"
*Apr 26 04:57:39.037: BR0:2 CHAP: O SUCCESS id 104 len 4
*Apr 26 04:57:39.045: BR0:2 PPP: Phase is VIRTUALIZED [0 sess, 0 load]
*Apr 26 04:57:39.049: Di0 MLP: Added link BR0:2 to bundle kevin
*Apr 26 04:57:40.045: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:2,
changed state to up
*Apr 26 04:57:40.749: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:57:40.757: OSPF: 2 Way Communication to 172.19.0.1 on Dialer0, state 2WAY
*Apr 26 04:57:40.757: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x67F opt
0x42 flag 0x7 len 32
*Apr 26 04:57:40.765: OSPF: End of hello processing
*Apr 26 04:57:40.801: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2175 opt
0x42 flag 0x7 len 32 mtu 1500 state EXSTART
*Apr 26 04:57:40.805: OSPF: NBR Negotiation Done. We are the SLAVE
*Apr 26 04:57:40.805: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2175 opt
0x42 flag 0x2 len 72
*Apr 26 04:57:40.853: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2176 opt
0x42 flag 0x3 len 72 mtu 1500 state EXCHANGE
*Apr 26 04:57:40.857: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2176 opt
0x42 flag 0x0 len 32
*Apr 26 04:57:40.865: OSPF: Database request to 172.19.0.1
*Apr 26 04:57:40.865: OSPF: sent LS REQ packet to 10.9.9.2, length 12
*Apr 26 04:57:40.905: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2177 opt
0x42 flag 0x1 len 32 mtu 1500 state EXCHANGE
*Apr 26 04:57:40.909: OSPF: Exchange Done with 172.19.0.1 on Dialer0
*Apr 26 04:57:40.909: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2177 opt
0x42 flag 0x0 len 32
*Apr 26 04:57:40.921: OSPF: Synchronized with 172.19.0.1 on Dialer0, state FULL
*Apr 26 04:57:40.925: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Dialer0
from LOADING to FULL, Loading Done
*Apr 26 04:57:44.917: %ISDN-6-CONNECT: Interface BRI0:2 is now connected to
6120 kevin
*Apr 26 04:58:00.753: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:58:00.753: OSPF: End of hello processing
*Apr 26 04:57:50.753: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:57:50.753: OSPF: End of hello processing

```

krimson#show interface serial 1

Serial1 is down, line protocol is down

*!--- note that the physical Frame Relay interface is down.* due to shutdown on locally  
attacher port on FR switch Hardware is HD64570 MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255 Encapsulation FRAME-RELAY, loopback not set  
Keepalive set (10 sec) LMI enq sent 53316, LMI stat recvd 52994, LMI upd recvd 0, DTE LMI down  
LMI enq recvd 3, LMI stat sent 0, LMI upd sent 0 LMI DLCI 1023 LMI type is CISCO frame relay DTE  
FR SVC disabled, LAPF state down Broadcast queue 0/64, broadcasts sent/dropped 62140/1,  
interface broadcasts 53317 Last input 00:00:57, output 00:00:57, output hang never Last clearing  
of "show interface" counters 3wld Input queue: 0/75/0/0 (size/max/drops/flushes); Total output  
drops: 0 Queueing strategy: weighted fair Output queue: 0/1000/64/0 (size/max  
total/threshold/drops) Conversations 0/3/16 (active/max active/max total) Reserved Conversations  
0/0 (allocated/max allocated) Available Bandwidth 48 kilobits/sec 5 minute input rate 0

bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 106450 packets input, 4627830 bytes, 0 no buffer --More-- Received 0 broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 115828 packets output, 7049810 bytes, 0 underruns 0 output errors, 0 collisions, 46426 interface resets 0 output buffer failures, 0 output buffers swapped out 77 carrier transitions DCD=down DSR=down DTR=up RTS=up CTS=down krimson#show interface serial 1.1

Serial1.1 is down, line protocol is down  
Hardware is HD64570  
Internet address is 10.5.5.2/24  
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation FRAME-RELAY

krimson#show interface dialer

Dialer0 is up, line protocol is up  
Hardware is Unknown  
Internet address is 10.9.9.1/24  
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation PPP, loopback not set  
DTR is pulsed for 1 seconds on reset  
Time to interface disconnect: idle 00:00:57  
Interface is bound to BR0:1  
Interface is bound to BR0:2  
LCP Open, multilink Open  
Open: IPCP  
Last input 00:00:09, output never, output hang never  
Last clearing of "show interface" counters 8w0d  
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0  
Queueing strategy: weighted fair  
Output queue: 0/1000/64/0 (size/max total/threshold/drops)  
Conversations 0/1/16 (active/max active/max total)  
Reserved Conversations 0/0 (allocated/max allocated)  
Available Bandwidth 66 kilobits/sec  
5 minute input rate 0 bits/sec, 0 packets/sec  
5 minute output rate 0 bits/sec, 0 packets/sec  
31025 packets input, 2102400 bytes  
31053 packets output, 2101523 bytes  
Bound to:  
BRI0:1 is up, line protocol is up  
Hardware is BRI  
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation PPP, loopback not set  
Keepalive not set  
DTR is pulsed for 1 seconds on reset  
Interface is bound to Di0 (Encapsulation PPP)  
LCP Open, multilink Open  
Last input 00:00:11, output 00:00:01, output hang never  
Last clearing of "show interface" counters never  
Queueing strategy: fifo  
Output queue 0/40, 0 drops; input queue 0/75, 0 drops  
30 second input rate 0 bits/sec, 0 packets/sec  
30 second output rate 0 bits/sec, 0 packets/sec  
34919 packets input, 2419929 bytes, 0 no buffer  
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles  
29 input errors, 18 CRC, 0 frame, 0 overrun, 0 ignored, 11 abort  
34744 packets output, 2252062 bytes, 0 underruns  
0 output errors, 0 collisions, 27 interface resets  
0 output buffer failures, 0 output buffers swapped out  
925 carrier transitions  
Bound to:  
BRI0:2 is up, line protocol is up  
Hardware is BRI

```
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set
Keepalive not set
DTR is pulsed for 1 seconds on reset
Interface is bound to Di0 (Encapsulation PPP)
LCP Open, multilink Open
Last input 00:00:03, output 00:00:07, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
2165 packets input, 87326 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
2260 packets output, 89305 bytes, 0 underruns
0 output errors, 0 collisions, 27 interface resets
0 output buffer failures, 0 output buffers swapped out
345 carrier transitions
```

```
krimson#show frame pvc
```

```
PVC Statistics for interface Serial1 (Frame Relay DTE)
```

```
Active Inactive Deleted Static
```

```
Local 0 0 1 0
Switched 0 0 0 0
Unused 0 0 0 0
```

```
DLCI = 20, DLCI USAGE = LOCAL, PVC STATUS = DELETED, INTERFACE = Serial1.1
```

```
input pkts 53307 output pkts 62181 in bytes 3853472
out bytes 6343822 dropped pkts 0 in FECN pkts 0
in BECN pkts 0 out FECN pkts 0 out BECN pkts 0
in DE pkts 0 out DE pkts 0
out bcast pkts 62123 out bcast bytes 6337256
pvc create time lw2d, last time pvc status changed 00:01:12
```

```
krimson#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

```
Gateway of last resort is 10.200.16.1 to network 0.0.0.0
```

```
192.168.64.0/30 is subnetted, 1 subnets
C 192.168.64.0 is directly connected, Dialer4
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
C 10.9.9.2/32 is directly connected, Dialer0
O 10.8.8.0/24 [110/782] via 10.9.9.2, 00:01:03, Dialer0
!--- now route to the destination network points to backup interface as a next hop C
10.9.9.0/24 is directly connected, Dialer0 C 10.7.7.0/24 is directly connected, Loopback0 C
10.9.8.0/24 is directly connected, Dialer1 C 10.200.16.0/24 is directly connected, Ethernet0 S*
0.0.0.0/0 [1/0] via 10.200.16.1
```

A interface do Frame Relay vem acima, e a Interface de backup vai para baixo.

```
krimson#show interface serial 1.1
```

Serial1.1 is up, line protocol is up  
Hardware is HD64570  
Internet address is 10.5.5.2/24  
MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255  
Encapsulation FRAME-RELAY

\*Apr 26 04:59:49.481: %LINK-3-UPDOWN: Interface Serial1, changed state to up  
\*Apr 26 04:59:50.481: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1,  
changed state to up  
\*Apr 26 05:01:44.001: Di0 DDR: idle timeout

*!--- backup is going down after expiration of the idle timer* \*Apr 26 05:01:44.001: DDR:  
Dialer Watch: watch-group = 1 \*Apr 26 05:01:44.001: DDR: network 10.8.8.0/255.255.255.0 UP, \*Apr  
26 05:01:44.005: DDR: primary DOWN \*Apr 26 05:01:44.009: Di0 DDR: disconnecting call \*Apr 26  
05:01:44.013: BR0:1 PPP: Phase is TERMINATING [0 sess, 1 load] \*Apr 26 05:01:44.013: BR0:1 LCP:  
O TERMREQ [Open] id 106 len 4 \*Apr 26 05:01:44.021: BR0:2 PPP: Phase is TERMINATING [0 sess, 1  
load] \*Apr 26 05:01:44.021: BR0:2 LCP: O TERMREQ [Open] id 54 len 4 \*Apr 26 05:01:44.029: Di0  
IPCP: State is Closed \*Apr 26 05:01:44.033: Di0 PPP: Phase is TERMINATING [0 sess, 1 load] \*Apr  
26 05:01:44.033: Di0 LCP: State is Closed \*Apr 26 05:01:44.037: Di0 PPP: Phase is DOWN [0 sess,  
1 load] \*Apr 26 05:01:44.041: Di0 IPCP: Remove route to 10.9.9.2 \*Apr 26 05:01:44.045: BR0:1  
LCP: I TERMACK [TERMsent] id 106 len 4 \*Apr 26 05:01:44.049: BR0:1 LCP: State is Closed \*Apr 26  
05:01:44.049: BR0:1 PPP: Phase is DOWN [0 sess, 1 load] \*Apr 26 05:01:44.053: BR0 DDR: has  
total 1 call(s), dial\_out 1, dial\_in 0 \*Apr 26 05:01:44.057: BR0:1 PPP: Treating connection as a  
callout \*Apr 26 05:01:44.057: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]  
\*Apr 26 05:01:44.061: BR0:1 LCP: O CONFREQ [Closed] id 107 len 15 \*Apr 26 05:01:44.065: BR0:1  
LCP: AuthProto CHAP (0x0305C22305) \*Apr 26 05:01:44.069: BR0:1 LCP: MagicNumber 0x2184A57C  
(0x05062184A57C) \*Apr 26 05:01:44.069: %DIALER-6-UNBIND: Interface BR0:1 unbound from profile  
Di0 \*Apr 26 05:01:44.077: BR0:1 DDR: disconnecting call \*Apr 26 05:01:44.077: BR0:1 DDR: Dialer  
Watch: resetting call in progress \*Apr 26 05:01:44.081: DDR: Dialer Watch: watch-group = 1 \*Apr  
26 05:01:44.081: DDR: network 10.8.8.0/255.255.255.0 UP, \*Apr 26 05:01:44.085: DDR: primary DOWN  
\*Apr 26 05:01:44.085: ISDN BR0: Event: Hangup call to call id 0x818D \*Apr 26 05:01:44.089: ISDN  
BR0: process\_disconnect(): call id 0x818D, call type is DATA, b\_idb 0x221DA8, ces 1, cause  
Normal call clearing(0x10) \*Apr 26 05:01:44.097: %ISDN-6-DISCONNECT: Interface BRI0:1  
disconnected from 6120 kevin, call lasted 120 seconds \*Apr 26 05:01:44.101: ISDN:  
get\_isdn\_service\_state(): idb 0x221DA8 bchan 2 is\_isdn 1 Not a Pri \*Apr 26 05:01:44.105:  
CCBRI\_Go Fr Host InPkgInfo (Len=13) : \*Apr 26 05:01:44.105: 5 0 1 81 8D 3 8 1 90 8 2 80 90 \*Apr  
26 05:01:44.109: \*Apr 26 05:01:44.121: ISDN BR0: TX -> DISCONNECT pd = 8 callref = 0x10 \*Apr 26  
05:01:44.129: Cause i = 0x8090 - Normal call clearing \*Apr 26 05:01:44.137: BR0:2 LCP: I TERMACK  
[TERMsent] id 54 len 4 \*Apr 26 05:01:44.141: BR0:2 LCP: State is Closed \*Apr 26 05:01:44.141:  
BR0:2 PPP: Phase is DOWN [0 sess, 1 load] \*Apr 26 05:01:44.145: BR0 DDR: has total 0 call(s),  
dial\_out 0, dial\_in 0 \*Apr 26 05:01:44.149: BR0:2 PPP: Treating connection as a callout \*Apr 26  
05:01:44.149: BR0:2 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] \*Apr 26  
05:01:44.153: BR0:2 LCP: O CONFREQ [Closed] id 55 len 15 \*Apr 26 05:01:44.157: BR0:2 LCP:  
AuthProto CHAP (0x0305C22305) \*Apr 26 05:01:44.161: BR0:2 LCP: MagicNumber 0x2184A5D9  
(0x05062184A5D9) \*Apr 26 05:01:44.161: %DIALER-6-UNBIND: Interface BR0:2 unbound from profile  
Di0 \*Apr 26 05:01:44.165: BR0:2 DDR: disconnecting call \*Apr 26 05:01:44.173: ISDN BR0: Event:  
Hangup call to call id 0x818E \*Apr 26 05:01:44.173: ISDN BR0: process\_disconnect(): call id  
0x818E, call type is DATA, b\_idb 0x225754, ces 1, cause Normal call clearing(0x10) \*Apr 26  
05:01:44.181: %ISDN-6-DISCONNECT: Interface BRI0:2 disconnected from 6120 kevin, call lasted 119  
seconds \*Apr 26 05:01:44.189: ISDN: get\_isdn\_service\_state(): idb 0x225754 bchan 3 is\_isdn 1 Not  
a Pri \*Apr 26 05:01:44.189: CCBRI\_Go Fr Host InPkgInfo (Len=13) : \*Apr 26 05:01:44.193: 5 0 1 81  
8E 3 8 1 90 8 2 80 90 \*Apr 26 05:01:44.197: \*Apr 26 05:01:44.205: ISDN BR0: RX <- RELEASE pd = 8  
callref = 0x90 \*Apr 26 05:01:44.221: ISDN BR0: TX -> DISCONNECT pd = 8 callref = 0x11 \*Apr 26  
05:01:44.225: Cause i = 0x8090 - Normal call clearing \*Apr 26 05:01:44.241: CCBRI\_Go Fr L3 pkt  
(Len=4) : \*Apr 26 05:01:44.241: 4D 1 10 97 \*Apr 26 05:01:44.245: \*Apr 26 05:01:44.249: ISDN BR0:  
LIF\_EVENT: ces/callid 1/0x818D HOST\_DISCONNECT\_ACK \*Apr 26 05:01:44.253: ISDN:  
get\_isdn\_service\_state(): idb 0x221DA8 bchan 2 is\_isdn 1 Not a Pri \*Apr 26 05:01:44.257: ISDN  
BR0: HOST\_DISCONNECT\_ACK: call type is DATA \*Apr 26 05:01:44.257: %LINK-3-UPDOWN: Interface  
BRI0:1, changed state to down \*Apr 26 05:01:44.265: BR0:1 LCP: State is Closed \*Apr 26  
05:01:44.265: BR0:1 PPP: Phase is DOWN [0 sess, 0 load] \*Apr 26 05:01:44.269: BR0:1 DDR:  
disconnecting call \*Apr 26 05:01:44.273: ISDN BR0: LIF\_EVENT: ces/callid 1/0x818D  
HOST\_DISCONNECT\_ACK \*Apr 26 05:01:44.277: ISDN: get\_isdn\_service\_state(): idb 0x221DA8 bchan 2  
is\_isdn 1 Not a Pri \*Apr 26 05:01:44.277: ISDN BR0: HOST\_DISCONNECT\_ACK: call type is DATA \*Apr  
26 05:01:44.289: ISDN BR0: TX -> RELEASE\_COMP pd = 8 callref = 0x10 \*Apr 26 05:01:44.305: ISDN

```
BR0: RX <- RELEASE pd = 8 callref = 0x91 *Apr 26 05:01:44.325: CCBRI_Go Fr L3 pkt (Len=4) : *Apr
26 05:01:44.325: 4D 1 11 97 *Apr 26 05:01:44.329: *Apr 26 05:01:44.333: ISDN BR0: LIF_EVENT:
ces/callid 1/0x818E HOST_DISCONNECT_ACK *Apr 26 05:01:44.337: ISDN: get_isdn_service_state():
idb 0x225754 bchan 3 is_isdn 1 Not a Pri *Apr 26 05:01:44.341: ISDN BR0: HOST_DISCONNECT_ACK:
call type is DATA *Apr 26 05:01:44.341: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
*Apr 26 05:01:44.345: BR0:2 LCP: State is Closed *Apr 26 05:01:44.349: BR0:2 PPP: Phase is DOWN
[0 sess, 0 load] *Apr 26 05:01:44.349: BR0:2 DDR: disconnecting call *Apr 26 05:01:44.353: ISDN
BR0: LIF_EVENT: ces/callid 1/0x818E HOST_DISCONNECT_ACK *Apr 26 05:01:44.357: ISDN:
get_isdn_service_state(): idb 0x225754 bchan 3 is_isdn 1 Not a Pri *Apr 26 05:01:44.361: ISDN
BR0: HOST_DISCONNECT_ACK: call type is DATA *Apr 26 05:01:44.369: ISDN BR0: TX -> RELEASE_COMP
pd = 8 callref = 0x11 *Apr 26 05:01:45.009: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to down *Apr 26 05:01:45.017: %LINEPROTO-5-UPDOWN: Line protocol on
Interface BRI0:2, changed state to down krimson#show isdn active
```

```
-----
ISDN ACTIVE CALLS
-----
```

```
Call Calling Called Remote Seconds Seconds Seconds Charges
Type Number Number Name Used Left Idle Units/Currency
-----
```

```
krimson#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
```

```
Gateway of last resort is 10.200.16.1 to network 0.0.0.0
```

```
192.168.64.0/30 is subnetted, 1 subnets
```

```
C 192.168.64.0 is directly connected, Dialer4
```

```
10.0.0.0/24 is subnetted, 6 subnets
```

```
C 10.5.5.0 is directly connected, Serial1.1
```

```
O 10.8.8.0 [110/1563] via 10.5.5.1, 00:00:11, Serial1.1
```

```
!--- The monitored router again shows the primary interface as the next hop C 10.9.9.0 is
directly connected, Dialer0 C 10.7.7.0 is directly connected, Loopback0 C 10.9.8.0 is directly
connected, Dialer1 C 10.200.16.0 is directly connected, Ethernet0 S* 0.0.0.0/0 [1/0] via
10.200.16.1
```

## Troubleshooting

Esta seção fornece informações que podem ser usadas para o troubleshooting da sua configuração.

A configuração do Frame Relay mostrada aqui, que tem subinterfaces ponto a ponto e usa o Open Shortest Path First (OSPF) como um protocolo de roteamento, é específica a esta instalação. Contudo, os passos de Troubleshooting dados abaixo são mais gerais e podem ser usados com configurações diferentes tais como o Frame Relay ponto-a-multiponto ou o link principal com o High-Level Data Link Control (HDLC) e o encapsulamento PPP, apesar do protocolo de roteamento usado.

Para verificar o backup de funcionalidade, nós colocamos uma das relações no Cisco 4500 Router que está atuando como um Frame Relay Switch no estado de fechamento, a fim simular problemas dentro da rede do Frame Relay. Conseqüentemente, isso leva ao estado inativo de PVC conduzido ao roteador DTE por meio da rede de frame relay e a um evento de parada de subinterface de frame relay. Isto ativa a Interface de backup.

## Comandos para Troubleshooting

Determinados comandos show são suportados pela Ferramenta Output Interpreter, que permite que você veja uma análise do resultado do comando show.

**Note:** Antes de emitir **comandos debug**, consulte [Informações importantes sobre comandos debug](#).

- **debugar o q931 de ISDN** - Informação dos indicadores sobre a configuração de chamada e desconexão das conexões de rede ISDN (camada 3) entre o roteador local (lado do usuário) e a rede.
- **debug isdn events** - Exibe eventos de ISDN que ocorrem no lado do usuário (no roteador) da interface ISDN.
- **debug dialer** - Exibe informações de depuração sobre os pacotes ou eventos em uma interface de discador.
- **debug ppp negotiation** - Faz com que o comando debug ppp exiba pacotes PPP transmitidos durante a inicialização de PPP, em que as opções de PPP são negociadas.
- **debug ppp authentication** - Faz com que o comando debug ppp exiba mensagens de protocolo de autenticação, incluindo alterações de pacote do Protocolo de autenticação de desafio (CHAP) e intercâmbios de Protocolo de autenticação de senha (PAP).
- **debug ip ospf events** - Indica a informação em eventos relacionados a OSPF, tais como adjacências, informação de inundação, seleção de designated router, e cálculo do caminho mais curto primeiro (SPF)
- **debug frame-relay events** - Indica a informação sobre debugging sobre respostas ARP do Frame Relay nas redes que apoiam um canal de transmissão múltipla e usam o endereçamento dinâmico.

## Informações Relacionadas

- [Página de suporte da tecnologia de discagem](#)
- [Suporte Técnico - Cisco Systems](#)